



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

No 6/9C/300

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Ohaus Model D51XW30WR3 Weighing Instrument

submitted by Ohaus Corporation
Unit 3, 220 Turner Street
Port Melbourne VIC 3207.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 76, *Non-automatic Weighing Instruments, Parts 1 and 2*, dated July 2004.

This approval becomes subject to review on **1/06/22**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 5 approved – certificate issued	4/03/09
1	Pattern & variants 1 to 5 reviewed & updated – certificate issued	30/05/17

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/9C/300' and only by persons authorised by the submitter.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates No S1/0/A or No S1/0B.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to the instrument shall be within the limits specified herein and in any approval documentation for the components where they are approved separately.

Special

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Dr A Rawlinson

TECHNICAL SCHEDULE No 6/9C/300

1. Description of Pattern **approved on 4/03/09**

An Ohaus model D51XW30WR3 single-interval self-indicating weighing instrument (Table 1 and Figure 1) with a maximum capacity of 30 kg and a verification scale interval of 0.01 kg. Instruments are NOT FOR TRADING DIRECT WITH THE PUBLIC and shall be so marked.

Instruments may be fitted with output sockets (output interfacing capability) for the connection of peripheral and/or auxiliary devices.

Notes: The pattern may also be known as a model Defender 5000.

The model numbers for instruments, indicators and baseworks are generally also followed by an AU suffix to indicate items intended for the Australian market.

1.1 Basework

The Ohaus model D30WR basework has the load receptor directly supported by a single load cell. The load receptor has maximum nominal dimensions of 300 × 300 mm, and typically has a stainless steel platform supported by a stainless steel frame.

1.2 Load Cell

A Mettler Toledo model SSP1241 load cell of 50 kg maximum capacity is used.

1.3 Indicator

An Ohaus model T51XW digital indicator is used (Figure 1) which is also described in the documentation of approval NMI S517. The indicator may be attached directly to the base, located separately from the base, or mounted on a column attached to the base. The indicator may also be known as “5000 Series Xtreme W”.

1.3.1 Zero Setting

A zero-tracking device may be fitted.

The initial zero-setting device has a nominal range of not more than 20% of the maximum capacity of the instrument.

The instrument has a semi-automatic zero-setting device with a nominal range of not more than 4% of the maximum capacity of the instrument.

1.3.2 Tare

A semi-automatic subtractive taring device of up to the maximum capacity of the instrument may be fitted.

The instrument has a pre-set tare function (with scale interval equal to the scale interval of the instrument) which can be accessed (tare values set) only via the RS-232 interface. A sign “PT” is shown in the display whenever the pre-set tare function is activated.

1.3.3 Display Check

A display check is initiated whenever power is applied.

1.3.4 Power Supply

The indicator operates from mains AC power (110–240 V AC, nominal).

1.3.5 Interfaces

The indicator may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. The interfaces shall comply with clause 5.3.6 of NMI R76 (the basic intent of which is that it shall not be possible to alter weighing results via the interfaces).

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with NMI General Supplementary Certificates No S1/0/A or No S1/0B (in particular in regard to the data and its format).

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

Serial interface options (e.g. RS 232) may be fitted.

1.3.6 Additional Features

The indicator may have additional functions such as ‘counting’ and or ‘units’ functions (the ‘units’ function may select indication in ‘g’ rather than ‘kg’ – selection of other units, e.g. ‘lb’, ‘oz’ shall not be possible). The additional functions (other than the indications of measured mass, i.e. gross, tare, net, displayed either on the indicator or on an auxiliary or peripheral device) are not approved for trade use.

1.4 Levelling

The instrument is provided with adjustable feet and adjacent to the level indicator is a notice advising that the instrument must be level when in use.

1.5 Sealing Provision

Access to facilities to alter calibration of the instrument is restricted by a software setting, together with a switch located on the main circuit board.

Prior to physically sealing access within the instrument housing (either using a lead and wire type seal or destructible adhesive labels as shown in Figure 2), it should be checked that the software setting and switch are set to prevent alteration of calibration. This can be carried out by:

- Commencing with the instrument switched off. Apply power, and press the ‘ON/ZERO/OFF’ button to turn on the instrument.
- If, during the power-on sequence, the instrument displays “Lft. On” and “Lock. On” then the software setting and switch are correctly set to prevent alteration of calibration.


1.6 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.7 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer’s mark, or name written in full Ohaus Corporation

Indication of accuracy class			
Maximum capacity	<i>Max</i>	g or kg	#1
Minimum capacity	<i>Min</i>	g or kg	#1
Verification scale interval	<i>e</i> =	g or kg	#1
Maximum subtractive tare	<i>T</i> = -	g or kg	#2
Serial number of the instrument		
Pattern approval mark for the indicator	6/9C/300		
Pattern approval mark for other components		#3

#1 These markings shall also be shown near the display of the result if they are not already located there.

#2 This marking is required if *T* is not equal to *Max*.

#3 May be located separately from the other markings.

In addition, instruments not greater than 100 kg capacity carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

2. Description of Variant 1 **approved on 4/03/09**

Certain Ohaus Defender 5000 series instruments, as listed in Table 1, which are similar to the pattern, but which use different platforms, with some of the platforms using Mettler Toledo model SSP1241 load cells, and others using Mettler Toledo model SSP1260 load cells. The platforms are in the D...W series, and are of various sizes and capacities – they typically have a stainless steel platform supported by a stainless steel frame.

3. Description of Variant 2 **approved on 4/03/09**

Certain Ohaus Defender 5000 series instruments, as listed in Table 1, which are similar to the pattern, but which use different platforms, with some of the platforms using Mettler Toledo model MT1241 load cells, and others using Mettler Toledo model MT1260 load cells. The platforms are in the D...Q series, and are of various sizes and capacities – they typically have a stainless steel platform supported by a painted steel frame.

4. Description of Variant 3 **approved on 4/03/09**

Certain Ohaus Defender 5000 series instruments, as listed in Table 1, which are similar to the pattern, but which use different platforms, with some of the platforms using Mettler Toledo model MT1241 load cells, and others using Mettler Toledo model MT1260 load cells. The platforms are in the D...H series, and are of various sizes and capacities – they typically have a stainless steel platform supported by a painted steel frame.

5. Description of Variant 4 **approved on 4/03/09**

Certain Ohaus Defender 5000 series instruments as listed in Tables 1, 2 or 3, using an Ohaus model T51 P digital indicator.

The Ohaus model T51P digital mass indicator (Figure 3a) is similar to the model T51XW described for the pattern but has a housing of ABS plastic construction, and may be powered by batteries (6 × ‘C-type’) and/or by mains AC power (110–240 V AC, nominal).

Sealing is as described for the pattern (note need to check software and switch settings prior to sealing), except that sealing methods are shown in Figure 4.

6. Description of Variant 5

approved on 4/03/09

Certain baseworks of this approval used with a compatible approved (by Supplementary Certificate) indicator provided the conditions set out below are met. In this case instruments may be known according to the basework model number (e.g. model D30WR).

In addition to the markings specified in clause **1.7 Descriptive Markings and Notices**, instruments are marked with the NMI approval number for the indicator used, together in the same location.

The approved baseworks and their limiting characteristics are given in Tables 1 and 2. The conditions to be met are given below, and include calculations using the following terms:

E_x = Excitation from indicator (V)

LC_Sens = Load cell sensitivity (mV/V)

E_{max} = Load cell maximum capacity (kg)

Indicator Sensitivity = Minimum sensitivity value per verification scale interval for the indicator (μV)

e = verification scale interval of the instrument (kg). ***In the case of multi-interval or multiple range instruments, any reference to 'e' refers to the smallest verification scale interval (i.e. e_1).***

e_1, e_2, \dots = verification scale interval of each range for multiple range instruments (or partial weighing ranges for multi-interval instruments), e_1 refers to the smallest verification interval.

Max = the maximum capacity of the instrument. This refers to the maximum capacity of the highest range (i.e. Max_r for multiple range instruments).

Max_r = the maximum capacity of the instrument for a multiple range instrument, i.e. the maximum capacity of the highest range.

$Max_1 Max_2 \dots$ = the maximum capacity of the instrument for a multiple range instrument, i.e. the maximum capacity of the highest range.

n_{LC} = the maximum number of verification intervals for which the load cell or basework is approved (e.g. 3000 for a 'class C3' load cell).

DR = dead load return value for the load cell. Note: Many load cells do not have a specified DR value.

The conditions are:

- The excitation voltage used is within the range approved for the baseworks.
- The maximum load applied to the basework (live load plus any dead load) does not exceed the load cell maximum capacity.
- The verification scale interval is not less than the minimum value specified. ***In the case of multi-interval or multiple range instruments, the***

verification scale interval refers to the smallest verification scale interval (i.e. e_1).

- The number of verification scale intervals is less than or equal to the n_{max} value specified. **In the case of multi-interval or multiple range instruments, the number of verification scale intervals refers to the largest number in any weighing range or partial weighing range (i.e. the largest of Max_1/e_1 , Max_2/e_2 etc).**
- The signal voltage per verification scale interval is not less than the minimum sensitivity value per verification scale interval for the indicator (as specified in the approval documentation for the indicator), i.e.

$$\text{Indicator Sensitivity} \leq 1000 \times Ex \times LC_Sens \times e / E_{max}$$

Additional requirement for multi-interval operation:

In the case of indicators which are configured to form a multi-interval weighing instrument the instrument shall comply with one of the following conditions:

- (i) **The smallest verification scale interval (e_1) shall satisfy the following:**

$$e_1 \geq Max/n_{LC}$$

- (ii) **Or, the smallest verification scale interval (e_1) shall satisfy the following:**

$$e_1 \geq 2 \cdot DR \cdot Max/E_{max}$$

Of course (ii) cannot apply where a value of 'Deadload return' DR is not given.

Additional requirement for multiple range operation:

In the case of indicators which are configured to form a multiple range weighing instrument the instrument shall comply with one of the following conditions:

- (i) **The smallest verification scale interval (e_1) shall satisfy the following:**

$$e_1 \geq 0.4 Max_r/n_{LC}$$

- (ii) **Or, the smallest verification scale interval (e_1) shall satisfy the following:**

$$e_1 \geq DR \cdot Max_r/E_{max}$$

Of course (ii) cannot apply where a value of 'Deadload return' DR is not given.

TEST PROCEDURE

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

For multi-interval and multiple range instruments with verification scale intervals e_1, e_2, \dots , apply e_1 for zero adjustment, and for maximum permissible errors apply e_1, e_2, \dots , as applicable for the load.

TABLE 1

TABLE 1

Instrument model	D###15WR3	D###30WR3	D###60WL4	D###150WL4	D###300WX4
Basework model	D15WR	D30WR	D60WL	D150WL	D300WX
Platform size (mm x mm)	300 x 300	300 x 300	450 x 450	450 x 450	600 x 600
Maximum capacity	15	30	60	150	250
Typical verification scale interval	0.005	0.01	0.02	0.05	0.1
Maximum number of verification scale intervals (n_{max})	3000	3000	3000	3000	3000
Load cell model	SSP1241-30	SSP1241-50	SSP1241-100	SSP1241-200	SSP1260-300
Load cell classification	C3	C3.5	C3.5	C3	C3
Load cell maximum capacity (E_{max})	30	50	100	200	300
Number of load cells	1	1	1	1	1
Minimum value of verification scale interval for basework (v_{min} of load cell)	0.005	0.0083	0.0166	0.0333	0.0500
Load cell sensitivity (at E_{max})	2	2	2	2	2
Input impedance	387	387	387	387	387
Excitation voltage (maximum)	20	20	20	20	20
Cable length ($\pm 0.1m$)	2	2	2	2	2
Number of leads (plus shield)	6	6	6	6	6

Note: ### in the instrument model shown above is determined according to the indicator used:

- ### represents 51XW if the model T51XW indicator is used; or
- ### represents 51P if the model T51P indicator is used (variant 4); or
- where an alternative compatible approved indicator is used, ### may be omitted, i.e. instruments may be known according to the basework model (variant 5).

Certain Approved Defender 5000 Series Instruments

TABLE 2

TABLE 2

Instrument model	D###15QR1	D##30QR1	D##60QL2	D###150QL2	D###300QX2
Basework model	D15QR	D30QR	D60QL	D150QL	D300QX
Platform size (mm x mm)	300 x 300	300 x 300	450 x 450	450 x 450	600 x 650
Maximum capacity (kg)	15	30	60	150	250
Typical verification scale interval	0.005	0.01	0.02	0.05	0.05
Maximum number of verification scale intervals n_{max}	3000	3000	3000	3000	3000
Load cell model	MT1241-50	MT1241-50	MT1241-100	MT1241-200	MT1260-300
Load cell classification	C3.5	C3.5	C3.5	C3	C3
Load cell maximum capacity (E_{max})	30	50	100	200	300
Number of load cells	1	1	1	1	1
Minimum value of verification scale interval for basework (v_{min} of load cell)	0.005	0.0083	0.0166	0.033	0.0500
Load cell sensitivity (at E_{max})	2	2	2	2	2
Input impedance	410	410	410	410	410
Excitation voltage (maximum)	20	20	20	20	20
Cable length (± 0.1 m)	2	2	2	2	3
Number of leads (plus shield)	6	6	6	6	6

Note: ### in the instrument model shown above is determined according to the indicator used:

- ### represents 51XW if the model T51XW indicator is used; or
- ### represents 51P if the model T51P indicator is used (variant 4); or
- where an alternative compatible approved indicator is used, ### may be omitted, i.e. instruments may be known according to the basework model (variant 5).

TABLE 3

TABLE 3

Instrument model	D###15HR1	D###30HR1	D###60HR1 ID###60HL2]	D###100HL2	D###150HX2	D###300HX2
Basework model	D15HR	D30HR	D60HR [D60HL]	D100HL	D150HX	D300HX
Platform size (mm x mm)	305 x 355	305 x 355	305 x 355 [400 x 500]	400 x 500	420 x 550	420 x 550
Maximum capacity (kg)	15	30	60	100	150	300
Typical verification scale interval	0.005	0.01	0.02	0.05	0.05	0.1
Maximum number of verification scale intervals n_{max}	3000	3000	3000	3000	3000	3000
Load cell model	MT1241-30	MT1241-50	MT1241-100	MT1241-150	MT1260-300	MT1260-500
Load cell classification	C3	C3.5	C3.5	C3	C3	C3
Load cell maximum capacity (E_{max})	30	50	100	150	300	500
Number of load cells	1	1	1	1	1	1
Minimum value of verification scale interval for basework (v_{min} of load cell)	0.005	0.0083	0.0166	0.025	0.05	0.083
Load cell sensitivity (at E_{max})	2	2	2	2	2	2
Input impedance	410	410	410	410	410	410
Excitation voltage (maximum)	20	20	20	20	20	20
Cable length ($\pm 0.1m$)	2	2	2	2	3	3
Number of leads (plus shield)	6	6	6	6	6	6

Note: ### in the instrument model shown above is determined according to the indicator used:

- ### represents 51XW if the model T51XW indicator is used; or
- ### represents 51P if the model T51P indicator is used (variant 4); or
- where an alternative compatible approved indicator is used, ### may be omitted, i.e. instruments may be known according to the basework model (variant 5).

FIGURE 6/9C/300 – 1



Ohaus Model D51XW30WR3 Weighing Instrument
Using an Ohaus Model T51XW Indicator

FIGURE 6/9C/300 – 2



Sealing of Ohaus T51XW (lead and wire type seal).

Alternatively destructible adhesive labels may be used over the housing join on two sides of the instrument housing.

FIGURE 6/9C/300 – 3



Ohaus Model D51P30HR1 Weighing Instrument
Using an Ohaus Model T51P Indicator

FIGURE 6/9C/300 – 4



Sealing of Ohaus T51P.

Use either lead and wire type seal, or labels over the joint at each side of the indicator housing.

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